

Reflecting upon this situation, **Dr Rishi Raj Borah, Country Director, Orbis India** says, “Tele-consultation and telehealth have proven to be effective avenues for eye care service to patients during the lockdown and technology will play a ground-breaking role in future as well given the COVID-19 situation. Our success does not lie in isolated initiatives or interventions but in collaborations and partnerships. It goes without saying, then, that collaborations are imperative to eliminate avoidable

blindness and accelerate the fulfilment of the larger sustainable development goals.”

Sharing her perspective on how the recent pandemic situation made things worse for eye healthcare in India, **Dr Kshipra Aphale, Consulting Eye Surgeon**, says, “During the pandemic, many people developed viral conjunctivitis, which was most probably due to COVID-19, but as it was not very serious, it was not given much importance. Clotting phenomenon in COVID-19 patients led to fungal eye infections (mucormycosis) and many people lost their eyes. This combination of virus and fungus was new to the medical world. Because of many cases of dry eye, multiple tear substitute eye drops have come up and devices for increasing tear flow were developed like lipiflo. That led to severe cases of corneal infections, glaucoma attacks, over ripe cataract cases which also damage the vision.”

What is India's vision for the future?

There are several common eye problems in India that one may notice in men, women and in children. Some of these are conjunctivitis, myopia, diabetic retinopathy, cataract, glaucoma, amblyopia, dry eye syndrome, blepharitis, entropion, macular degeneration, presbyopia to name a few.

India has the world's largest population of the blind, and it is estimated that the country has 12 million preventable blindness cases, who will become partially or fully blind, if not treated in time. The cases of preventable blindness occur due to cataract, diabetic eye disease, vitamin A deficiency and trauma related blindness.

To address these problems, there are major players operating in the Indian vision care market such as Luxottica India Eyewear, GKB Rx Lens, Essilor India, Carl Zeiss India, Bausch & Lomb India, Titan Industries, Auro Laboratories, Johnson & Johnson and many others. These market players are constantly making efforts to launch novel products for vision care in the form of eye drops, lens, spectacles, surgery devices, imaging and monitoring systems.

Mumbai-based ENTOD Pharmaceuticals has very recently got the approval to carry out phase 3 trials across India for their 0.05 per cent atropine eye drops from the Drugs Controller General of India (DCGI). This higher strength of low-dose atropine eye drops is not available commercially anywhere in the world, and ENTOD Pharmaceuticals would be the first company to launch this in India subject to a successful demonstration of safety & efficacy in clinical studies.

Low-dose atropine has emerged as an effective approach to slow the progression of myopia in children and has recently garnered a lot of interest from ophthalmologists.

Sharing more details about the need of such products, **Nikhil K Masurkar, Executive Director, ENTOD Pharmaceuticals**, says “We have already recruited several clinical research sites across India to start phase 3 trial studies and hopefully, we should be the first company in the world to get approval for marketing 0.05 per cent atropine eye drops from the DCGI. Being market leaders in paediatric ophthalmology medicine, we hope this new therapeutic addition to the low-dose atropine range will allow us to tackle the menace of childhood myopia in India. Myopia is the most important cause of visual impairment in children and as per a study by All India Institute of Medical Science (AIIMS), 17 per cent of children or 1 out of 6 children in India between the ages of 5 and 15 years are suffering from myopia.”

A new player in the market, Mumbai-based Optocred Pharmaceuticals has launched Diminfect and Diminfect D that are India's first Moxifloxacin and Moxifloxacin-Dexamethasone eye drops available in 10ml vials each, to fight eye diseases.

The other product Credohyl, according to Optocred, is the game-changer in the ophthalmic industry. It is the first sodium hyaluronate ophthalmic solution with 0.18 per cent Sodium hyaluronate combined with Coenzyme Q10 and Tocopherol (Vitamin E) for extra lubrication and with one of its kind antioxidant action. Credolube eye drops is India's first ultimate coolant with the advanced effect of D-panthenol and Allercred is India's first ophthalmic anti allergic kit.

On the other hand, Advanced Micro Incision Glaucoma Surgery (using istent- developed by US-based Glaukos Corporation) was recently conducted for the first time in India at Shree Ramkrishna Netralaya, Mumbai. This is the world's smallest medical device known to be implanted in the human body.

It's a micro-invasive glaucoma surgery procedure, which not only helps in managing glaucoma effectively and safely but also helps in fighting the key issue of non-adherence to current medication i.e. eye drops, the key reason for glaucoma progression in 53 per cent of treated patients. Since glaucoma is asymptomatic, the damage is already advanced once the patient realises that he has visual problems.

American-Swiss company Alcon has commercially launched the first and only presbyopia-correcting intraocular lens (PC-IOL) with wavefront-shaping technology - the AcrySof IQ Vivity IOL (Vivity) in India. Approved by the Central Drug Standard Control Organisation, Vivity is now available to Indian ophthalmologists for their patients undergoing cataract surgery.

“The new generation of seniors spend significant time with technology screens like phones, tablets and computers, and currently experience a massive gap in near and intermediate vision post-surgery. Vivity addresses this gap and the desire of patients who want to get rid of cataracts and presbyopia at the same time. As a result, patients can be less dependent on glasses for most activities post-surgery, enhancing their visual satisfaction and quality of life. Vivity is the first and only extended depth of focus lens with Alcon's proprietary X-WAVE technology, which stretches and shifts light without splitting it”, explains **Shalav Modi, Country Franchise Head, Surgical, and Country Manager, Alcon Laboratories India**

With technology being the ‘new hero’ of this era, Aravind Eye Hospital has recently introduced the use of artificial intelligence powered eyeglasses manufactured by Bengaluru-based software company Smart Global Technology in collaboration with US-based NGO, Vision Aid. The device is claimed to be the first of its kind launched in the country for the visually impaired.

While the industry is continuously developing new products to counter the eye health problems, more work needs to be done to improve eye health research in India.

With advancements being made in the field of stem cells and genomics, these areas can be well explored to find better solutions to the growing eye problems in both children and adults. Greater resource allocation by the government and introduction of a 'real' research culture in our medical colleges can make the future more promising. For instance, LV Prasad Eye Institute Hyderabad campus is now equipped with state-of-the-art ophthalmic research biorepository, said to be the first in the country. Biorepositories are collections of human tissue for future research on disease mechanisms, therapeutics and diagnostics.

“Age-related macular degeneration (AMD) is the most common cause of blindness in people older than 60 years worldwide. About 15 -25 million people in India suffer from AMD, a disease affecting the eye's nerve called the retina. While there is no definitive treatment to halt the progression of dry AMD, there has been remarkable scientific progress over the last few years, making a cure likely in the medium term. Replacing the lost cells via stem cell therapy is one such promising treatment. Many companies are working on replacing the RPE cells via surgical procedures to achieve this. Others are trying to address the genetic changes underlying AMD with gene therapy”, says **Dr Rajani Battu, Co-Founder and Chief Medical Officer, Eyestem.**

In addition, more adequately trained ophthalmologists are required to manage these problems. Major effort is required to improve the quality of residency training across the country and increase funding for better research. Only then can we have enough professionals who can offer comprehensive ophthalmic care and adopt faster to the newer ideas and technologies. Until then, myopia, cataract, glaucoma, AMD etc. will remain as our ongoing challenges into the future.

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